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THE CLIMATE CLUB APPROACH: THE KEY TO EFFECTIVE CLIMATE CHANGE NEGOTIATIONS?

Incentivizing participation in ambitious international climate policy

Bachelor's Thesis
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Abstract

The climate club model has been proposed as an alternative approach to international climate change mitigation policy. Unlike the unilateral negotiations organized under the United Nations climate convention, a climate club would be comprised of countries that commit to ambitious emissions reductions and provide incentives to encourage cooperation and deter free-riding. In this thesis, I conduct a literature review to examine the potential of the climate club approach, intending to discover whether a club mechanism could produce an effective agreement that the UN approach has failed to achieve. The findings from microeconomic theory and simulation models indicate that a climate club might indeed achieve broad participation and significant abatement levels. Of the possible incentive configurations, both side-payments, sanctions, and a combination of club goods and conditional commitments are shown to be effective options. While the theoretical potential of the climate club approach appears high, its implementation would likely be complicated by legal and political barriers. The club design would therefore need to account not only for effectiveness but also for political feasibility.

Keywords climate clubs, climate change mitigation, international negotiations, club theory

TABLE OF CONTENTS

1. INTRODUCTION

Slowing the perilous temperature rise of our planet demands ambitious internationally coordinated action, but the global community struggles to move on from talk to effective policy setting. Nearly three decades have passed since 197 nations agreed on the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, thereby committing to "prevent dangerous man-made interference with the global climate system" (European Commission). Yet, it is evident that "dangerous interference" with the climate system is far from averted: greenhouse gas concentration in the atmosphere is reaching record levels, "locking in the warming trend for generations to come" and thus threatening life on Earth through effects like sea level rise, wildfires, and extreme weather conditions (World Meteorological Organization, 2019). Indeed, accumulating evidence indicates that the international effort to effectively mitigate climate change is failing. According to Hovi et al. (2016), a climate agreement would have to "attract broad participation among major emitters, obligate the participating countries to cut their emissions considerably, and achieve high compliance rates" to be regarded as effective (p. 1). The UNFCCC has clearly fallen short of meeting these requirements, given the poor participation rate and limited global emissions coverage of the 1997 Kyoto Protocol and the nationally determined, unenforceable emissions reduction targets of the 2015 Paris Agreement (ibid). It is thus crucial to consider new models for climate negotiations that could bring about an effective agreement that is long overdue. One potential alternative is the club approach.

Rather than concentrating on unilateral negotiations like those under the UN climate convention, a growing literature explores the potential of minilateralism–that is, cooperation beginning in smaller groups of countries, or climate clubs (see, e.g. Hovi et al., 2016). For instance, the Nobel prize-winning economist William Nordhaus (2020) puts his faith in an approach he calls "the Climate Club." In the model he presents, a coalition of states committed to strong emissions reductions would penalize non-participant countries by tariff measures. Other scholars have introduced differing proposals, but the central idea in the various climate club schemes is consistent: the key to effective cooperation is to incentivize participation and commitment through offering benefits to rule-abiding members and/or issuing penalties to non-members (Hovi et al., 2016, p. 3; Nordhaus, 2020). The definition of a climate club followed in this paper is thus a group of nations that voluntarily commits to taking ambitious climate change mitigation measures and encourages membership and compliance through effective incentives. The incentive structure is the crucial element that distinguishes the club approach from the UN negotiations. In fact, Nordhaus (2020) claims that the failure of the UNFCCC stems from the fact that those agreements are essentially "regimes with zero penalty tariffs," which are shown by "both history and modeling" to "induce minimal abatement." By contrast, a club that would provide net benefits to members who commit to the agreed-upon mitigation efforts could offset the countries' incentive to free-ride on other nations' contributions. Examples of successful club mechanisms in international treaties, such as trade agreements or military defense alliances, further point to the potential of the climate club approach.

In particular, the World Trade Organization (WTO) emerged from a club of nations with a shared ambition to reduce international trade barriers; by providing compliant members access to a low barrier market, the club succeed in creating a self-enforcing mechanism by which joining the club became more attractive the more members it had (Håkan, 2020, p. 50). It is important to note that the minilateralist proposals discussed here are indeed proposals: climate clubs that fit the above definition exist so far only on the level of thought. Moreover, this concept of a climate club differs pivotally from the existing smaller groups of nations that take action outside of the UN convention, which are also often referred to as "climate clubs" but only serve the main purpose of facilitating dialogue or implementing specific projects, not generating ambitious emissions reductions (Weischer et al., 2012, p. 180). For this paper, a climate club's potential for leading to effective climate change mitigation is essential.

In this thesis, I conduct a literature review of the scholar work on climate clubs. I examine prominent club proposals and analyses of the concept's potential, intending to discover whether or not a minilateral solution could be the answer to the problems of international climate negotiations, and if so, what type of incentive structure would be the most promising.

The theoretical potential of the climate club approach appears to be relatively high. The global public good nature of climate change mitigation demands a more robust incentive structure to discourage free-riding, and by providing that, a club could indeed succeed in reducing global emissions better than the unilateral UNFCCC approach. Simulation models also point to the potential of various incentive mechanisms: trade sanctions, side-payments, and a combination of club goods and conditional commitments are all shown to be effective under certain conditions. Nevertheless, careful design of the club's structure is needed not only to ensure effectiveness but also to increase the political feasibility of the club. The club's prospective success depends largely on its ability to achieve political legitimacy, which would require resolving potential legal and political issues, including conflicts with international trade principles and a lack of public support. Perhaps the most promising scenario for future climate diplomacy is the one where the climate club would coexist as a complementary model to the UNFCCC approach; while the UN convention would continue to provide an open, legitimate forum for global negotiations, the club would generate the needed ambitious mitigation through effective incentives.

The paper proceeds as follows. In the next section, I discuss the theory behind the supposed success of a club approach and delve into the various climate club proposals. The following section examines the potential of different incentives as they pertain to club effectiveness and growth. Next, I consider the matter of a climate club's prospective feasibility and relation to the UN climate convention. The final section presents the conclusions.

2.1 Overcoming the Obstacle of Free-Riding

Analyzing global climate policy from the perspective of microeconomics helps us understand the limited success of past agreements and the promise of the climate club approach. What makes international climate negotiations particularly challenging is the public good nature of climate change mitigation. Because the benefits of climate stabilization accrue to the whole globe regardless of which nation pays the costs of abatement, countries have an incentive to free-ride; by definition, free-riding happens when "a party receives the benefits of a public good without contributing to the costs" (Nordhaus, 2015, p. 1339). In the case of climate change mitigation, it is in an individual nation's interest to leave the costly emissions reductions to others (ibid). Nordhaus (2020) specifies that the majority of the benefits from a country's emission cuts accrue abroad–even the major players, China and the United States, would only gain at most 15 percent of the benefits their mitigation efforts would have in total. Similarly, a single country incurs only a small fraction of the global costs of climate change, below 10 percent on average (Nordhaus, 2015, p. 1349), which helps to explain why mitigation is not as high on the agendas of national governments as it optimally should be. Moreover, countries refusing to cut their emissions levels are doing so at the expense of future generations who will be forced to pay the costs (ibid p. 1339). As can be seen, nations acting in their short-sighted self-interest will not undertake sufficient abatement measures if left to their own devices.

While there are market and governmental mechanisms to ensure efficient levels of public good provision on the domestic level, none exist for global public goods such as climate change mitigation (ibid p. 1949). This lack of effective solutions stems from the principles of modern international law and the "Westphalian dilemma." The concept refers to the 1648 Treaty of Westphalia, which established that nations have "fundamental right to political self-determination" and that states are "legally equal" and "free to manage their internal affairs without the intervention of other states." The Westphalian system essentially ordains all international agreements voluntary, since countries' participation requires their consent. (ibid). Moreover, the UNFCCC negotiations include a critical barrier known as the consensus rule, which gives veto power to the least enthusiastic party and, needless to say, hinders the formation of an effective international climate treaty (Hovi et al., 2016, p. 3). In simple game-theoretical terms, states can be thought of as strategic players who maximize their own national welfare and, in the absence of a binding agreement, end up not committing to ambitious mitigation efforts (Nordhaus, 2020). This unfavorable outcome can be described as a prisoners' dilemma, where the game ends in a noncooperative equilibrium where too little abatement is done (ibid). Here is where the club mechanism comes in: by directly remolding the incentives of individual countries to favor stronger mitigation measures, the approach inspires hope for effective climate cooperation.

2.2 The Theory Behind Climate Clubs

The theory behind the minilateral approach begins with the economic definition of clubs. Nordhaus (2015) characterizes a club as a "voluntary group deriving mutual benefits from sharing the costs of producing an activity that has public-good characteristics" (p. 1340). Furthermore, he points out that a successful club must provide its members gains large enough to induce them to adhere to its rules to access the benefits of membership (ibid). Besides offering benefits to member countries, a climate club might decide to punish non-cooperative nations. These penalties can be thought of as "internalization devices" that correct the global externality of climate change mitigation, much like regulation or tax mechanisms are used to internalize externalities within countries (ibid p. 1349). A literature review by Hovi et al. (2016) extends the analysis back to the origins of general club theory. Chiefly, the authors acknowledge the early contributions of Buchanan (1965), Wiseman (1957), and Olson (1965), whose works can be categorized by the type of goods their concept of a club provided: rival or nonrival, excludable or nonexcludable. To begin with, Buchanan defined a club "as a member-owned institutional arrangement aiming to provide a 'club good,'" which he determined to be excludable and non-rival up to a point of moderate consumption level. Wiseman on his part focused on rival and excludable ("private") goods, developing a club principle for cost-sharing of public utilities use, whereas Olson studied rival and non-excludable ("common pool") goods. In this four-part framework, climate clubs would fit the fourth class of "public goods," since climate change mitigation is both non-rival and non-excludable. (ibid p. 2).

Furthermore, Hovi et al.'s paper presents a later scholastic contribution by Prakash and Potoski (2007), who differentiate between two types of clubs, "Buchanan" and "voluntary" clubs. In a Buchanan club, the club's primary goal is to produce and allocate club goods, as in a sports club whose main function is to provide the needed facilities to the members. By contrast, the primary goal of a voluntary club is to provide a public good or another benefit that creates a positive externality. While there exist no incentives for free-riding in Buchanan clubs since only the contributing members can access the benefits, free-riding can present a notable problem in voluntary clubs. Voluntary clubs must thus encourage participation in the production of the public good by offering the members exclusive benefits, called "club goods in the wide sense" by Hovi et al. to distinguish from Buchanan club goods (termed "club goods in the narrow sense"), or simply "club goods" as they are usually referred to in climate club literature and henceforth in this paper. A climate club can be considered as a voluntary club since it aims to motivate countries to undertake climate change mitigation (a global public good that generates a positive externality) and provides incentives to prevent free-riding. (ibid p. 3). In essence, the theory behind the proposed success of a climate club boils down to incentivizing countries to become members and abide by the rules of the club in exchange for granting them access to benefits of membership or freedom from penalties for noncooperation. While scholars formulate their climate club blueprints on this same theoretical groundwork, the propositions diverge when it comes to more specific sketches of the clubs.

2.3 Different Proposals for Club Design

A diverse set of proposals for climate club arrangements emerges in the literature. In fact, there exists no single climate club approach, but rather multiple opinions on various questions of club design. The first such question has to do with club emergence: in particular, whether the world should adopt a "bottom-up" or a "top-down" approach. The more prevalent proposal seems to be the bottom-up model, in which cooperation is initiated by a small group of nations (see, e.g. Hovi et al., 2017, p. 6). This proposal is credited to Victor (2011), who advocates the idea of starting in small groups based on the claim that serious progress on emissions control emerges when nations can flexibly determine what they "can and will implement at home" (p. 23). By contrast, he argues, unilateral treaties not only focus on policies that are outside of governments' control (namely, specific emission targets and timetables as opposed to more practical policy decisions) but also encourage nations to "offer only the lowest common denominator" when it comes to ambition. Negotiations in smaller groups would also allow governments to more easily agree on complex deals on policies and membership benefits, both of which Victor envisions to be contingent on what actions the countries' offer and implement. (ibid). Moreover, he conceptually divides the world into two categories: "enthusiastic" and "reluctant" countries. Enthusiastic countries are defined as the "engine of international cooperation" who are willing to invest their own resources to emissions control, whereas the reluctant nations do not value climate change mitigation as an important national target (ibid p. 11). His proposal centers on having enthusiastic countries initiate the club formation and create incentives to entice reluctant nations to join (ibid p. 23). Several scholars build upon Victor's approach where cooperation evolves from a small group of enthusiastic countries, Hovi et al. among them. Furthermore, Falkner (2016) highlights the theoretical advantages of climate negotiations with fewer parties, which would enable faster and more effective bargaining among the more ambitious nations, creation of incentives to encourage broader participation, and easier enforcement of the commitments (pp. 91–92). Providing membership benefits and imposing sanctions would also be less costly to implement in a small group (ibid). By contrast, Nordhaus (2015) does not support the idea of starting small. His proposal for a climate club is top-down, meaning that the regime's design is first "optimized to attract large numbers of participants and attain high levels of abatement," and only afterward do countries decide whether or not to join (p. 1344). Nordhaus validates his approach by bringing attention to the unsuccessful empirical and theoretical record of bottom-up alliances for cartels and public goods. Specifically, a finding known as the "small coalition paradox" shows that while the level of public good production should theoretically rise along with the increase in the number of participants, the opposite happens in reality. In fact, studies in environmental economics have "virtually universally" discovered a tendency for coalitions to be "either small or shallow," which results from the free-riding problem that presents itself in agreements with many participants. To explain this in the context of climate clubs, the difference between the optimized cooperative and noncooperative levels of abatement grows as more countries join the coalition, which creates an incentive for an individual member to

defect. (ibid pp. 1345-1346). Nordhaus thus concludes that a climate club emerging in a bottom-up fashion would result not in an effective agreement, but rather in one with either too few members or unambitious goals.

The second question of climate club design is the matter of what type of mitigation commitment the countries should agree on. Here, too, the opinions differ. For one, Nordhaus (2020) supports setting an international target price for carbon rather than controlling the emissions quantitatively. He presents a number of reasons for why a rule on a carbon price would be more promising than a quantitative emissions constraint: First, agreement on a target carbon price would enable the equalization of carbon prices everywhere and thus lead to efficient climate change mitigation where the marginal costs of abatement were equated across all countries and sectors. Second, bargaining about a single price would simplify the negotiations, whereas bargains about country-specific emission limits would "likely end up with no limits at all" for the simple reason that nations would want low restrictions for themselves and high for others. Third, there exist multiple possibilities for achieving a wanted minimum carbon price, including taxes or cap-and-trade mechanisms, and hence each country could choose the approach it finds most suitable. (ibid). Håkan (2020) agrees with Nordhaus in supporting a carbon price agreement, adding to the reasons that it would build on existing institutions (either on tax bureaucracies or on markets for other resources) and "provide governments with income and an opportunity to reduce other, distorting taxes" (pp. 51–52). By contrast, Hovi et al. (2017) propose that countries would agree on an emissions reduction target as a fixed percentage of their GDP, deeming prices to be "politically less realistic" although "economically more efficient" (p. 6). Victor (2011) has his own views. Partly siding with Nordhaus, he claims that diplomacy focused on setting target levels for emissions is an "odd" choice since the quantity of emissions depends on many forces beyond direct governmental control, such as on relative fuel prices and the state of the economy (p. xxxi). However, he does not suggest bargaining about a carbon price target but rather argues that countries should focus on negotiating contingent policies, placing more emphasis on the importance of setting realistic, implementable goals and less on the question of price or quantity control. (ibid). As can be seen, there is much variation in the different versions of the climate club concept. While these questions of club emergence and agreement type certainly affect the club's potential, at the heart of the climate club approach is the incentive structure meant to encourage participation and compliance with the club rules. The next section enquires into the possible incentives and their impact on the climate club's expected effectiveness.

3. EFFECTIVE INCENTIVE STRUCTURE

3.1 Determinants of Climate Club Success

At the core of the climate club approach is a carefully designed set of incentives to deter free-riding. Since the club's potential effectiveness depends largely on the efficacy of those incentives, the

conditions for the climate club's success are discussed here. To begin with a reminder, an "effective" climate agreement must engage a significant portion of major emitter countries in considerable emissions reductions (Hovi et al., 2016, p. 1). For a climate club to make a substantial dent in global emission levels, it must be able to attract members and ensure that they contribute with critical abatement actions (ibid p. 2). Attaining this requires providing cooperative nations excludable benefits large enough to guarantee their commitment to the club rules (e.g., Nordhaus, 2015, p. 1340). Another, a more practical point highlighted by Falkner (2016) is the need for establishing an effective global system for reporting, monitoring, and verification, since preventing shirking by countries who might untruthfully claim to obey the club rules would require keeping a reliable check on the members (pp. 93–94). Furthermore, the club arrangement would need to benefit each of the members, exclude or penalize non-members at a relatively low cost to members, and have stability in the sense that no member would want to leave (Nordhaus, 2015, p. 1341). The choice of the right incentives, whether they be benefits to the countries that participate or penalties to those who do not, is clearly an important concern.

In fact, scholars have identified conditions for the incentive mechanisms themselves under which the climate club can become effective. According to Weischer et al. (2012), the "core question" is to recognize the benefits that are most important for countries to be willing to commit to ambitious mitigation measures. He outlines four main conditions regarding the club goods that would increase the club's likelihood of success: First, the benefits must be significant, meaning that their perceived gains need to outweigh the costs. Second, the benefits have to be exclusive to the members of the club, for otherwise there will be an incentive to free-ride. Third, the benefits should be valuable to all club members. Fourth, the benefits need to respect international law. (pp. 187-188). Furthermore, Hovi et al. (2016) add that providing the benefits to members and denying them to non-members should cost the club little to nothing and that the benefits need to be apart from the direct benefits of climate change mitigation–that is, they must involve issue linkage (p. 3). The need for non-climate benefits stems from the fact that the benefits of abatement cannot be excluded from non-cooperative countries (Falkner, 2016, p. 92). In addition to club benefits, there are conditions outlined for potential penalties as well. According to Nordhaus (2015), the sanctions imposed on noncooperative countries need to have two critical features: they should be both external and incentive-compatible (p. 1351). By external, Nordhaus refers to penalties that are linked to a set of payoffs unconnected to those of the original game; trade sanctions, for example, would be separate from the payoffs of climate change mitigation and therefore external (p. 1344). The second critical point, incentive-compatibility, means that the penalties should not "penalize the penalizer" as many sanctions do but rather impose costs on the non-members and benefit the member countries (p. 1351). A key takeaway from this analysis is that thorough effort needs to be put into organizing the climate club's incentive structure, such that it will be in the interest of each prospective member to join and abide by the agreed-upon emissions reductions. The rest of the section explores the potential mechanisms to change the countries' incentives, categorized here as club goods, sanctions, or side-payments.

3.2 Club Goods

Providing exclusive benefits, or club goods, for rule-abiding member countries is a central aspect of many climate club proposals. A broad scale of potential club goods has been introduced in the literature. One common suggestion is cooperation in technology research and development (R&D). For example, participating countries could engage in joint R&D projects and share intellectual property rights, fostering the development of low carbon technologies (Hovi et al., 2016, p. 3). However, scholars recognize multiple potential problems with having technology collaboration as a club good, beginning with incentive incompatibility. The incentives may align unwantedly in two ways: For one, it would likely not be in the members' interest to withhold the R&D results from non-members. Secondly, the members might also have a "reverse incentive" not to share intellectual property rights after the basic research phase, since low-emission technologies can be "crucial to national exports and growth strategies." Cooperation is also complicated by the fact that a single major country or a multinational corporation could develop most such technologies with lower transaction costs, which leaves only technologies with very high uncertainties and absolute costs as candidates for intergovernmental cooperation (ibid). Moreover, Falkner (2016) points out that international collaboration on energy efficiency and green technology is especially difficult for several reasons, including the fragmentation of global energy governance and competing policy objectives (pp. 92–93). Granted, it seems that the potential of shared technology R&D as a club good is rather weak. Other possible benefits also related to the development of a low-emissions economy include joint projects and trade in services (Weischer et al., 2012, pp. 189–190). While the former could comprise low-carbon initiatives like infrastructure investments or demonstration projects, the latter refers to trading services (such as developing, installing, and maintaining of renewable energy projects) as well as allowing freer movement of persons across the member nations (and thus helping to reduce barriers like strict immigration rules and visa requirements that can impede the migration of professionals or students in climate-related fields). In addition to cooperation on low-emission technology R&D, projects, or service trading, a climate club could offer membership benefits linked to international trade.

Potential club goods related to trade could take the form of border carbon adjustments, tariffs, or non-tariff measures. Border carbon adjustments would function as a mechanism to combat carbon leakage, or transfer of emission-intensive production to countries with more lenient environmental regulation, by imposing a fee on certain imports from such countries (Hovi et al., 2016, p. 3; Weischer et al., 2012, p. 190). As Hovi et al. (2016) explain, border carbon adjustments would allow climate club members to protect their domestic producers who would otherwise suffer the cost disadvantage in international trade compared with competitors who are not subject to as stringent environmental standards (p. 3). Weischer et al. (2012) for their part suggest that exemption from the border carbon adjustments, were they implemented internationally, would be the club good (p. 190). In addition to border carbon adjustments, scholars have proposed broader trade linkage to incentivize club membership. For example, member nations could benefit from reduced barriers to

trade, possibly by way of lower or eliminated tariffs on sustainable goods, which would also raise the competitiveness of said goods compared with carbon-intensive alternatives (ibid). While access to a low-tariff zone could theoretically be an effective club good, this proposal has its issues. Notably, imposing higher tariffs on noncooperative nations might be detrimental to the self-interest of the members and conflict with international trade law (Hovi et al., 2016, p. 3). These obstacles may not be insurmountable, however: Record shows that nations "sometimes seem prepared to accept losses from imposing trade sanctions–particularly when they believe sanctions might serve a sufficiently important purpose." In reference to Victor's (2011) definition of enthusiast countries, it seems plausible to assume that enthusiast club initiators might be ready to give up potential trade benefits in order to penalize reluctant nations should they refuse to join the club. As for international trade law, tariff benefits exclusive to club members seem to violate the international trading system's (the General Agreement on Tariffs and Trade, GATT, and the WTO) most-favored-nation principle, which stipulates that all members must be granted similar benefits without discrimination. However, there are three major exemptions to this principle, which could enable the use of tariff measures as a club good. That is, the GATT Article XX(g) allows exemptions for the purpose of natural resource conservation, while the Article XXIV permits the formation of "free trade zones or customs unions that increase internal trade more than they divert global trade." Furthermore, the Enabling Clause (Decision on Differential and More Favorable Treatment Reciprocity and Fuller Participation of Developing Countries) grants developing countries permission to "prioritize development over trade while remaining members of the WTO." (ibid). Based on the Articles XX(g) and XXIV, creating a low-tariff zone for climate club members could be in accordance with trade law on the grounds that the tariff measures serve to conserve the environment and increase trade within the club more than they divert global trade. Yet, it is worthwhile to consider non-tariff measures that could avoid the complications of international trade principles. For instance, club members might focus on removing other trade barriers, such as "difficult customs procedures, divergent standards and certification rules, and peculiar technical requirements," which might be even more significant than tariffs (Weischer et al., 2012 p. 190). While these "non-tariff barriers" are hard to handle in unilateral negotiations because of difficulties in defining and quantifying them, a smaller group of nations might succeed in reaching an agreement (ibid). In any case, linking the climate club's incentive arrangement to international trade would require more extensive political and legal consideration. Linkage to trade is also proposed as a possible penalty for noncooperative nations. Evidently, tariffs can double as a club good and a sanction: on one hand, they benefit the member countries that are exempt from them, and, on the other, punish the non-members who are not. Before the discussion on trade sanctions, however, it is worth examining the findings of formal models on the potential of club goods.

A study by Hovi et al. (2017) yields insights on the expected effectiveness of membership benefits on climate club emergence and growth. Along with club goods, the authors consider the impact of another potential instrument, "conditional commitments:" equivalent to Victor's idea of contingent commitments, conditional commitments are offers whereby countries relate their

promised mitigations efforts, dependent on what other nations offer and implement (pp. 4–5). To investigate the conditions under which a climate club might succeed, Hovi et al. run numerical simulations of how climate clubs might attract more members and thus become more effective in reducing global emissions. The agent-based model used is a one-shot sequential game with an indefinite number of stages that considers a specific form of climate club, one where enthusiastic countries initiate the club and try to induce reluctant nations to participate (as in Victor's climate club approach) and where members must undertake abatement worth at least a percent of their GDP. The model considers two mechanisms for club growth: firstly, the club may provide club goods exclusive to the members, and secondly, members may offer to strengthen their mitigation efforts conditional on new members joining the club. While enthusiastic actors are assumed to participate automatically and exit the club only if it generates lower net private benefits compared to the no-club scenario, reluctant actors will join only if their pay-off as club members is greater than as free-riders. There are 141 actors (not countries, since the European Union is considered as a single actor) included in the model, which utilizes data on these actors' emissions, GDPs, and climate change vulnerability scores. (pp. 8–9).

The results of the study indicate that club goods and conditional commitments could have significant potential in achieving effective coverage of global emissions. In particular, the two instruments were shown to effectively induce climate cooperation under a broad range of conditions if used in combination, but only under a limited set of conditions if used separately. While it seems that the use of club goods without conditional commitments would lead to universal participation only under "very optimistic assumptions" regarding the member-only benefits a climate club can produce, providing club goods does substantially increase the odds of club emergence even if the benefits are more modest. As for conditional commitments, an interesting finding concerning their potential role in reducing global emissions is that credible conditional commitments made by enthusiastic major emitters can shift the cost-benefit calculations of reluctant countries by reducing their indirect mitigation costs and increasing the climate benefits of their abatement efforts (through triggering further mitigation efforts by other actors). Another key determinant of climate club success is found to be the question of which actors play the role of enthusiast club founders: while having the United States and the EU as initiators "greatly increases a club's prospects," enthusiasm is less needed from China (pp. 20–21). To sum up the insights from Hovi et al.'s study, club goods and conditional commitments seem to carry a lot of potential in producing an effective climate club, especially if both instruments could be implemented simultaneously and the club initiators were large economies controlling a sizable share of the global emissions. Overall, the results indicate that substantial enough club goods could incentivize reluctant nations who would otherwise free-ride on the contributors of others to participate in a climate club. As far as the work of these scholars is considered, it seems that simulation models approximating real-world conditions bolster the theoretical argument behind the effectiveness of membership benefits.

3.3 Sanctions

Besides offering benefits to rule-abiding member nations, imposing penalties for non-cooperation could have the wanted effect on climate club effectiveness. In fact, Nordhaus's (2015) climate club proposal relies on sanctions as the exclusive incentive mechanism: his main argument is that penalizing non-members is necessary to induce participation in agreements with ambitious mitigation levels (p. 1347). Nordhaus defines sanctions as "governmental withdrawal, or threat of withdrawal, of customary trade or financial relationships" and points out that they should benefit the senders and hurt the receivers to be effective. (ibid). He does, however, acknowledge that sanctions may not be incentive-compatible in the sense that they impose costs on the senders as well (ibid), but as was noted earlier, enthusiastic club members might be willing to accept the loss for the sake of the club's cause. Nordhaus divides sanctions on international trade into two categories: carbon duties and uniform tariff measures. Whereas the former are defined as tariffs levied on imports in relation to their carbon content, the latter refer to imposing a uniform percentage tariff on all imports from non-participant countries. Under carbon duties, imports from non-member nations would be taxed at the border to match the domestic (or international target) price, or alternatively, the importers would be required to purchase emissions allowances to cover the carbon content of imports. Similar to border carbon adjustments, the aim in both cases would be to combat carbon leakage, improve competitiveness in the global playing field, and cut down emissions. However, studies suggest that carbon duties "are complicated to design, have limited coverage, and do little to induce participation." By contrast, uniform tariffs would be both simpler and more transparent, Nordhaus argues, and their primary purpose would be to increase participation in the climate club. The rationale behind a uniform tariff is that noncooperative nations cause damage to other countries through their total greenhouse gas emissions, not only from "those embodied in traded goods," which would justify the use of a uniform rather than a carbon content specific duty. In his Climate Club proposal, Nordhaus settles on a uniform tariff. (ibid pp. 1348–1349).

However, scholars have also raised arguments against the use of climate tariffs. For instance, Falkner (2016) questions the feasibility of such an approach, highlighting two significant political barriers to trade sanctions. Firstly, he claims that sanctions are an "unrealistic tool" for constructing an effective climate coalition because reluctant nations would likely react to a punitive tariff not by joining the club but by challenging the use of sanctions altogether (p. 93). This is a valid concern, given that such tariffs would potentially violate multiple WTO provisions. On the other hand, scholars have recognized the issue with international trade law and pointed out that certain GATT articles could legitimize the minilateral use of tariffs, as was discussed earlier. Secondly, Falkner argues that negotiating an agreement with trade penalties would be particularly difficult and deems it unlikely that the leading emitter nations would accede to one, given that most major powers have usually opposed strong compliance mechanisms in environmental treaties (ibid). There is also the risk of retaliation: nations outside the club might impose retaliatory tariffs, leading to "escalating trade wars and protectionism." However, it can be argued that when balanced against the risks of

climate change, the risk of protectionism carries less weight. Moreover, retaliation is not definite, as outside nations might be hit harder by a trade conflict than club members. (Håkan, 2020, p. 53). Acknowledging the expected complications with his uniform tariff scheme, Nordhaus (2015) extends his proposal to include "climate amendments" to international trade law, which would "explicitly allow uniform tariffs on nonparticipants within the confines of a climate treaty" as well as "prohibit retaliation against countries who invoke the mechanism" (p. 1349). Leaving the analysis of the legal and political feasibility of such amendments to others, he points out that requiring them would emphasize the exceptionally critical threat of climate change and that the uniform tariff approach should not be used for every notable cause (ibid). Håkan (2020) also suggests that the WTO should be involved in establishing the legitimacy of climate tariffs (p. 53). In his view, carbon tariffs would count as "sanctions against misconduct," much like tariffs are used to manage other international conflicts (ibid). While the legal and political problems of trade sanctions merit thorough consideration, there is clearly reason to believe they are solvable.

As Nordhaus (2015) recognizes, empirical modeling is needed to complement economic analysis in order to determine the effectiveness of different climate club coalitions "in the context of actual emissions, damages, climate change, and trade structures" (p. 1352). The empirical approach he takes for this purpose is a game-theoretical simulation model called the C-DICE, or Coalition Dynamic Integrated model of Climate and the Economy. The C-DICE model examines coalition formation, seeking to determine whether or not countries join high-abatement clubs and to find stable coalitions. (ibid.) In other words, Nordhaus investigates whether a climate club with penalty tariffs on nonparticipating nations can generate an effective and stable coalition. Under Nordhaus's definition, a coalition is effective and stable if it approaches the global optimum level of abatement and if no sub-group can make itself better off by changing its status–in other words, there is a coalition Nash equilibrium, which extends the concept of Nash equilibrium for a single country to include individual (each country individually), collective (all countries together), and coalition rationality (all subsets of the countries) (ibid p. 1346). That is, a climate club in a coalition Nash equilibrium would be "stable against any combination of joiners and defectors." Nordhaus uses an evolutionary algorithm to find such stable equilibria, modeling 15 world regions with unique mitigations costs and damages from climate change. As mentioned earlier, he tests a mechanism of uniform tariffs as a penalty for nonparticipation, varying the tariff rates from zero to ten percent. Furthermore, the assumptions made are that penalty tariffs conform with international trade law and that retaliation by noncooperative nations is prohibited. The study also assumes that nations adopt an international target price as the policy instrument, set equal to the global social cost of carbon and ranging from 12.5 to 100 US dollars per CO_2 ton. Finally, countries are assumed to maximize their national economic welfare, which equals their standard income after subtracting the damages from climate change as well as the costs of abatement and trade sanctions (ibid p. 1366).

What Nordhaus concludes from the results is that sanctions are necessary to induce a stable climate coalition that improves on the noncooperative equilibrium, finding this to be true regardless of the selection of participating countries. As for the participation rate and efficiency, the results

indicate that the level of participation and the average target carbon price increase with the tariff rate. Nevertheless, Nordhaus finds that modest trade penalties are enough to generate a coalition that approaches the optimal abatement level as long as the global target carbon price stays below a certain level. For example, full participation and efficiency would be achieved with tariffs as low as two or three percent, if the target carbon price were at its lowest (12.5 USD or 25 USD per ton). In that case, it would be in each region's interest to cooperate because the losses from the tariff penalty exceed the costs of abatement. As the target carbon price rises, however, it becomes more and more difficult to reach the optimal cooperative level of abatement; for a target carbon price of 50 USD per ton, the climate club could attain a 90 percent efficiency with a tariff rate of 5 percent, but a carbon price of 100 USD would likely induce only the noncooperative level of mitigation even with higher tariffs. The reason behind the difficulty in reaching efficient mitigation with a high social cost of carbon is that while the abatement costs rise sharply with the international target carbon price, the costs of trade penalties incurred from not cooperating are independent of the carbon price. Thus a nation's "cost-benefit trade-off tilts toward nonparticipation" when the global target carbon price increases. (ibid pp. 1367–1368). In conclusion, Nordhaus's findings support the claim that a combination of target carbon pricing and modest trade penalties can induce a stable climate coalition with high abatement levels. While his climate-economic modeling provides "insights rather than single-digit accuracy" (Nordhaus, 2020), it does reinforce the logic behind the supposed success of a climate club that imposes sanctions on nonparticipants.

3.4 Side-Payments

Besides sanctions and club goods, scholars have discussed a third class of possible incentives: direct payments for club entry. Side-payments, a common instrument in international environmental policy, could make the desired impact on climate cooperation. Also termed financial transfers, the payments would be collected from member states and given to non-members in exchange for their participation (Sælen, 2016, p. 927). In his 2016 paper on side-payments' potential in building an effective climate club, Sælen reviews important insights from game-theoretical literature on the topic. Contrary to the rather recent research on climate clubs, there exists an established and extensive literature on the effect of side-payments on international environmental agreements. The dominating game-theoretical models can be categorized into two general classes: the first is membership models, also called two-stage or reduced-stage games, and the second is compliance models, or repeated games. Sælen's survey focuses mainly on membership models, which can be further classified as either cooperative or noncooperative. An essential contribution from cooperative game theory is the Chander-Tulkens rule, which stems from a straightforward side-payment scheme derived by Chander and Tulkens in 1995. The rule indicates that a scheme where all nations receive payments equal to the increase in their abatement costs from the noncooperative to the socially optimal equilibrium and contribute to the total side-payments according to their share of mitigation benefits (marginal damage cost divided by the total marginal damage cost) upholds

universal participation when the countries are heterogeneous. However, such sharing rules might result in inequitable and thus "politically unrealistic predictions" regarding poorer countries that, being generally more vulnerable to global warming, end up bearing a disproportionately large share of the effort and even compensating the rich. Some proposed schemes take fairness concerns into account, including the model developed by Sælen, which prohibits transfers from a poorer to a wealthier country. Cooperative models have also faced criticism for assuming too strongly that countries believe that the entire coalition would dissolve should they unilaterally withdraw, which amounts to unconvincingly severe punishment for nonparticipation. In contrast, noncooperative game-theoretical models build on a concept of internal and external stability from the study on cartel formation in oligopolies, which does not assume absolute coalition dissolution in reaction to individual withdrawal. A key result from this strand of literature is the "small coalition paradox," as Nordhaus (2015) calls the finding that shows coalitions' tendency to be "either narrow and deep or broad and shallow." As for side-payments, noncooperative models reach the same general conclusion as cooperative ones: side-payments can increase participation and abatement as long as the countries are heterogeneous. However, the membership models fail to address compliance with the agreed climate club commitments. Sælen points out two potential compliance issues with side-payments, the first being between donors and recipients and the second among donors. For one, it might be possible for a recipient to access the payment without taking the agreed mitigation action, or for it to take the action and not receive payment. The potential problem among the contributors is an incentive to free-ride on the donations of others: if this were the case, the club mechanism would simply transform the free-riding problem from abatement to side-payment contribution. Indeed, research indicates that noncompliance would benefit donors both through lesser mitigation and avoided side-payments, and thus a club with side-payments would need a "stronger deterrent against free-riding." On the other hand, defecting recipients would benefit from evading costly abatement measures but suffer from losing future side-payments, which makes side-payments an "ideal instrument to credibly sanction developing countries." (ibid pp. 912–914). Based on this review of game-theoretical literature on side-payments, it seems that financial transfers could at least theoretically generate an effective climate club if only certain conditions were met, such as heterogeneity of countries. Considering that countries do not have identical GDPs and emission levels, side-payments should, in theory, be a potential instrument for a climate-club.

Building on this background of research, Sælen (2016) employs an agent-based model to quantify the expected effect of monetary side-payments on climate collaboration and the extent of the transfers required (p. 911). He follows Victor's (2011) climate club model of enthusiastic and reluctant countries, assuming that a small group of enthusiastic nations incentivizes reluctant nations to join through side-payments (p. 911). Sælen's model is a one-shot sequential game of an indefinite number of stages that searches for potential side-payments deals, in which the payment's value falls below the club's benefit from the entrant's mitigation but exceeds the entrant's abatement cost. The reluctant nations are assumed to become members if their payoff inside the club is greater than outside as free-riders. As for the enthusiastic club founders, they stay in the club even if

unilateral withdrawal would benefit them and abandon it only if staying generates negative net private benefits compared to the scenario without any club at all. The model itself is built on empirical data of 141 actors' (the EU is modeled as a single actor) GDPs, emissions, vulnerabilities to climate change, and populations. Moreover, it assumes that the club members are obligated to undertake abatement for the worth of a uniform percentage of their GDP. (ibid pp. 915–916). The study's results regarding the potential of climate clubs based on side-payments are rather optimistic. In particular, Sælen demonstrates that side-payments have the highest potential in generating club growth compared to other instruments, including club goods or conditional commitments. He explains that the reason for the "relative effectiveness" of side-payments is that they are targeted only at prospective entrants, whereas mechanisms like club goods benefit members and nonmembers alike. More specifically, Sælen finds that the largest economies can, sometimes even individually, use side-payments to attract large sets of members that cover a substantial share of emissions. The scale of the side-payments needed depends on the size of the club as well as on which of the members contribute to the payments, the value of which ranges from tens to hundreds of billions of US dollars annually. If new members would take part in funding the side-payments, the club could reach "virtually universal participation" for "moderate abatement cost-benefit ratios," but in large clubs, the coordination problem among members grows in significance. Furthermore, the results indicate that side-payments would unlikely be enough to induce the richest countries to join if they were reluctant, even if transfers to the wealthier countries were allowed. This makes it crucial for rich nations to be on the enthusiastic side. (ibid pp. 926–927). Given these points, it appears that the use of side-payments could enable a climate club to substantially reduce global emissions, at least if wealthy large emitters were the club initiators.

However, as with trade sanctions, political feasibility may arise as a major obstacle for side-payments (ibid p. 927). Sælen acknowledges that the figures needed for an effective side-payment scheme would "likely be politically extremely challenging to muster," but he also points out that developed nations have already committed to collectively mobilizing billions of US dollars for climate change mitigation. Another issue is that some of the arrangements found to be successful in the model might in truth be hindered by external conflicts between countries. (ibid). Falkner (2016) presents additional skepticism toward relying on financial transfers as incentives in climate agreements (p. 93). After recognizing the prevalence of financial aid mechanisms in international environmental politics, including in the UNFCCC, he argues that their effect on global emissions has so far been "negligible." That is, the payments typically flown from developed countries to emerging economies have failed to roll back emissions in the developing nations. Falkner notes that while channeling the payments through smaller clubs could enable better targeted aid, he finds it unlikely that the contributor countries would be motivated enough to pay for significant abatement efforts in the Global South's largest emitters, who are also major economic competitors. He thus deems the role of financial transfers to be small in international climate change mitigation. (ibid). For the most part, it seems that side-payments could theoretically be a very potential instrument for incentivizing reluctant nations to join a climate club. Whether they would be implementable in the real world

depends on the countries' political willingness to commit to financially contributing the sums needed for an effective climate club scheme. In summary, if there are significant asymmetries between countries and the obstacles of political feasibility are resolved, Sælen's analysis suggests that a club could reach a wide coverage of global emissions for a moderate scale of side-payments, especially if large economies would be the initiators and recruited members would also participate in funding the subsequent transfers.

3.5 Summary of Findings

To recap this discussion on the possible incentives to be used in climate clubs, both theory and various simulation models suggest that club goods, sanctions, and side-payments might indeed be successful in inducing effective climate cooperation. The arguments in the literature diverge, however, when it comes to the question of which instruments would be most effective. Whereas Nordhaus (2015) maintains that sanctions would be necessary to incentivize participation in ambitious climate policy and demonstrates in a game-theoretic model that modest trade penalties combined with a sufficiently low target carbon price would be enough to attain an effective climate club, the agent-based model by Hovi et al. (2017) suggests that club goods reinforced by conditional commitments would likely produce clubs with broad coverage of global emissions. By contrast, Sælen's (2016) simulations indicate that the use of side-payments could generate substantial club growth with even higher potential than club goods or conditional commitments, as the monetary transfers accrue specifically to prospective entrants. All these results are, of course, dependent on assumptions and conditions that may or may not hold in the real world. In particular, scholars have raised doubts about the political obstacles that might obstruct the implementation of theoretically potential climate club proposals. To address these concerns, the following section delves deeper into the important questions of the club approach's feasibility.

4. FEASIBILITY CONCERNS AND RELATION TO THE UN CLIMATE CONVENTION

Regardless of how effective the minilateral proposals might appear in theory and empirical simulation models, a climate club approach can only make a difference in international climate cooperation if it can actually be implemented. It is thus crucial to explore how scholars have addressed concerns over the feasibility of climate clubs. To shed more light on the more practical matters of climate club implementation, this section tackles the political obstacles of climate club formation as well as the club's possible relation to the multilateral negotiations under the UNFCCC.

4.1 Design Features to Increase Political Legitimacy

When it comes to the feasibility of climate clubs, a central concern that arises is their potential lack of political legitimacy. To clarify, minilateral approaches to international climate negotiations

tend to suffer from low public support and thereby from governmental reluctance to engage in club-based climate cooperation, as Gampfer (2016) explains (p. 63). In his analysis of minilateralism's feasibility, Gampfer emphasizes the importance of domestic political support in the successful implementation of climate clubs. Public support is pivotal because voters' preferences are shown to have a significant influence on environmental governance, especially on climate policy decisions, which can very directly affect the consumption and lifestyle choices of citizens. Furthermore, democratically elected governments will choose to pursue the kind of climate governance architecture that in citizens' opinion provide their national economies benefits commensurate to the costs, a fact particularly pertinent in developing countries that "strive to balance goals of environmental sustainability, poverty reduction, and economic development." (ibid pp. 63–64). Internal political support is, therefore, a crucial factor in the prospects of a climate club's success. As for the determinants of domestic feasibility, political legitimacy is essential (ibid p. 64). Gampfer defines political legitimacy through two concepts, distinguishing between procedural and outcome legitimacy. Whereas procedural legitimacy stems from "normatively desirable characteristics of the governance process," such as the rights and obligations of participants and the fair distribution of economic and political burdens, outcome legitimacy refers to the "problem-solving performance" of the treaty, which in this context means how effectively the agreement can mitigate climate change. According to Gampfer, the reasons for minilateralism's low support can be summarized in four main points: First, he argues that climate clubs would lack the procedural-legal legitimacy that the UNFCCC has as part of the United Nations system. Indeed, the UN is considered to be the "default venue for cooperating on global problems" by the international community, and removing the climate negotiation process from its system would risk losing the legitimacy brought on by the universal organization. The second reason is that a club approach would place the economic burden of mitigation only on the members while the benefits would accrue to all nations regardless of participation, which would likely provoke resistance from the populations of cooperating countries. Thirdly, Gampfer identifies fear of placing the country's industries at a comparative disadvantage (due to being subject to stricter environmental regulation and higher energy costs than non-participants) as another reason for opposition among prospective member nations. The final reason has to do with the coalition's effectiveness in mitigating climate change: if the club failed to achieve substantial abatement, it would likely gain low support from members and non-members alike. (ibid pp. 64–65). Given these points, a climate club would have to overcome a number of potential barriers to achieve political legitimacy, a precondition for its successful implementation. Although Gampfer highlights the initial lack of public support for minilateral climate governance, he also notes that this legitimacy deficit could be alleviated by varying the club's design (ibid p. 62). Identifying the design features that can effectively shift voters' preferences in favor of minilateral negotiations is therefore crucial to gaining a more comprehensive understanding of the potential of the climate club approach.

To investigate the influence of different design elements on the political feasibility of climate clubs, Gampfer conducts conjoint experiments with population samples in the United States and India, titled as "the world's largest democracies" and "two crucial players in international climate

politics" (ibid p. 66). His study consists of two representative surveys, one from each country, and considers the impacts of the following agreement design features: share of the global emissions covered, nature of the emission reduction commitments, membership benefits, and sanctions on non-members. Based on theory, Gampfer anticipates the emissions coverage to be a crucial factor in the club's expected success, as political research suggests that voters might sometimes be willing to allow procedural legitimacy deficiencies in exchange for increased effectiveness. He thus hypothesizes that increasing the share of global emissions regulated under the club scheme would lead to higher support for the minilateral approach in prospective member and non-member countries alike. (ibid pp. 66–67). The results provide some support for this hypothesis, but only in the case where the United States participates in the club: while increasing the regulated emission share generates greater support when US membership is likely, respondents care little about the club's effectiveness if the US does not cooperate. As for the findings in India, the emissions coverage had no significant impact on the respondents' opinions. According to Gampfer, these results imply that voters' opposition to climate clubs is not likely to be mitigated by high effectiveness (ibid p. 81). The next design feature under consideration is the commitment nature, or more precisely, the question of which of the members would adopt binding mitigation commitments. As a matter of burden distribution, the answer to this question can be expected to notably impact the public's opinion of minilateralism. Gampfer anticipates that support for the climate club approach will be higher if every member country has to commit to reducing emissions, especially so in prospective member nations. (ibid p. 66). However, the results of his study suggest that universal commitments have a weaker effect on public support than expected. While the support in India remained largely the same across various commitment structures, Americans were shown to prefer universal commitments but significantly so only in the proposals where US membership was unlikely. It thus seems that burden-sharing within the club is not a major determinant of climate club approval in prospective member nations after all. (ibid p. 82).

In addition to the regulated emissions share and commitment nature, Gampfer analyzes the impact of member benefits and non-member disadvantages. As it turns out, club goods and sanctions affect not only the expected effectiveness of climate clubs but also the public support for the approach. Access to membership benefits should increase both the outcome legitimacy (by incentivizing greater participation and honoring of the commitments) and procedural legitimacy (as members would be compensated for taking on the mitigation burden) and could therefore lead to higher support for minilateralism in prospective member countries. Of course, the strength of the incentive in a given country would depend on the club good's perceived value in relation to the abatement costs. In any event, Gampfer hypothesizes that support for the climate club approach in prospective member nations would rise if membership benefits were provided, increasing with the value of such benefits. (ibid p. 66). The results do not entirely attest to the club goods' expected impact, however. Rather, the experiment suggests that the availability of membership benefits does not significantly influence respondents' views on climate clubs, which might reflect reservations regarding the value of the club goods. As citizens of a country that is unlikely to be on the receiving

end of climate finance and already enjoys rather low global trade barriers, American respondents may expect to see little value in the offered club goods; on the other hand, neither does the existence of club goods notably affect the responses in India. Moreover, these findings support the assessments of other scholars who believe that there exist no club goods valuable enough to induce significant abatement from major emitters. (ibid p. 82). The findings on penalizing noncooperative nations are similar. While Gampfer expects that imposing disadvantages on non-members would increase the public support in prospective member countries and conversely lower the support in likely non-member countries, the effect increasing with the severity of the disadvantages, he finds their impact to be insignificant in both directions (ibid p. 67 & 83). Although it seems that neither member benefits nor non-member disadvantages by themselves are valuable enough to notably influence the public opinion on minilateralism, Gampfer's results show that when used in combination, club goods and sanctions do increase support for a club approach. In fact, a club model in which various exclusive benefits are offered to members and disadvantages imposed on non-members gathers the highest support of all agreement types, including the current UNFCCC approach. The important implication for climate club design is thus that the agreement architecture should include "both sticks for outsiders and carrots for members" to increase public support and thereby the political feasibility of minilateralism. (ibid p. 83). However, other scholars have raised doubts about the international political feasibility of these agreement features. Club goods and sanctions linked to international trade, in particular, would likely be challenged by reluctant nations on the grounds of conflicting with global trade law, as Falkner (2016) points out (see the earlier section on incentive structure). Nevertheless, when it comes to domestic political support, it appears that a climate club proposal would have the greatest prospects of success by incorporating both membership benefits and penalties for non-participation. To sum up, careful structural design is needed to ensure not only incentive compatibility but also the political feasibility of the club, so that the approach would be both effective in mitigating climate change and implementable in the real world.

4.2 A Climate Club's Role in the Current Negotiation Landscape

Also an important question is the climate club's relation to the UNFCCC, the primary forum for international climate negotiations. While some scholars suggest that the club should replace the UN convention, others envision the coalition merely but importantly complementing it (Weischer et al., 2012, p. 178). Despite its critical flaws, the UNFCCC undeniably has its advantages. To begin with, the UNFCCC is "the one official forum where every country has a voice," which ensures it is accepted as legitimate. Secondly, it would be "rather short-sighted" to discard its set of institutions that have achieved results and taken many years to create, not to mention how difficult and time-consuming establishing parallel institutions would be. Thirdly, the UN provides a multilateral platform that is crucial to negotiations on global ambition and equity of climate change mitigation, in which every country has a stake. For these reasons, Weischer et al. (2012) argue that the climate club would be more effective as a complementary forum rather than a replacement for the UN

convention, which they deem still necessary for coordination among the larger set of nations. (ibid p. 191). Victor (2011) agrees in a sense, proposing that the UNFCCC should "remain as an umbrella under which many global efforts unfold" (p. 25). Nonetheless, he believes that ambitious climate change mitigation would have to begin in smaller climate clubs that would eventually expand. Without criticizing the UN per se, he argues that the institution's style of diplomacy is structured in a way unsuitable for managing the problem of global warming: in his words, the "open, global forum" is not equipped to "deliver much leverage" on greenhouse gas emissions in either the enthusiastic or the reluctant countries. Moreover, Victor asserts that governments are at fault in their protection of the "UN monopoly on climate diplomacy," making a case for diversity and competition in all areas of the international effort to mitigate climate change. Namely, he emphasizes that monopolies are especially treacherous when the best strategy is unidentified, as is the case with global climate governance. Transforming the monopolistic role of the UN platform to that of an umbrella institution for various experimental efforts would enable the successful strategies to attract more resources and the others to wither. In Victor's vision, this type of competition would make the UNFCCC itself more effective. (ibid p. 26). As can be seen, Victor (2011) advocates for more competitive roles for the climate club and the UNFCCC than Weischer et al. (2012), who envision a complementary relationship between the forums. Both agree that the climate club should not replace the UNFCCC, nonetheless. Based on their analysis, it seems that the optimal solution would be a coexistence of the club approach and the UN system, one where the international community would benefit from the advantages of both multilateral and minilateral climate policy. In essence, ambitious mitigation would arise from the effective incentives created in climate clubs, while the UN convention would provide a legitimate, universal forum for global discussions.

Of course, the world is a long way from adopting a minilateral approach to international climate negotiations. There are several obstacles hindering progress towards more effective climate policies, including the political influence of anti-environmental interests, free-riding of nations who seek only their own benefit, and the short-sightedness of governments who neglect the interests of the future, not to mention the ineffective incentive structure of the UNFCCC that fails to resolve these issues (Nordhaus, 2020). An important yet largely unexplored question is, therefore, how might a climate club get started? Nordhaus (2015) admits that there exists no clear answer to this question, as international regimes "evolve in unpredictable ways" (pp. 1351–1352). For Nordhaus, it seems to be enough to have the destination of the climate club clearly defined and acknowledge that "there are many roads to get there" (ibid). Weischer et al. (2012) do not speculate about the particulars either but note that initiating a transformative climate club will require "the political will of some pioneer countries to try it out and lead the way" (p. 192). The minilateral approach clearly breaks away significantly from the established UN model of negotiations, and taking on the role of a pioneer would be no small task. Yet, exactly that kind of boldness is needed when conventional diplomacy fails to yield results.

5. CONCLUSIONS

The climate club approach to international climate change negotiations promises to produce an effective agreement that the UNFCCC has failed to attain. The question this thesis aims to answer is whether or not this promise can be delivered–could a club of nations achieve a greater reduction in global emissions than the unilateral negotiations conducted under the agency of the United Nations? The main argument behind the minilateral proposals is founded on the microeconomic theory of clubs: to summarize, a club in economics is a group of actors deriving benefits from sharing the costs of producing a public good. In a climate club, a group of countries would commit to ambitious climate change mitigation (a global public good) and provide incentives to induce participation and compliance. In essence, the club mechanism would shift the cost-benefit calculations of nations such that joining the club would be more attractive than free-riding outside of it. Scholars have proposed various incentive structures for the club, ranging from member benefits and non-member penalties to side-payments, and I attempt to uncover which incentives would carry the highest potential for building an effective climate club.

Based on the literature reviewed, I conclude that a club approach could indeed generate more effective climate change mitigation than the UNFCCC. As for the potential of different incentive options, theory and findings from simulation models yield varying results. For example, Nordhaus (2015) comes to show in a game-theoretic model that a combination of trade sanctions and target carbon pricing can lead to significant mitigation, while a club without penalties for non-participation will dissolve into the non-cooperative, low-abatement equilibrium. Hovi et al. (2017), on the other hand, find an incentive structure with both club goods and conditional commitments to have a high potential for achieving effective coverage of global emissions. In contrast, Sælen (2016) argues that side-payments would work more effectively than instruments like club goods since the transfers accrue exclusively to prospective entrants. His results also suggest that large economies could induce broad participation through side-payments, especially if recruited member nations would also contribute to the payments and large economies were the club initiators. As can be seen, no single incentive option rises above the others in the literature but rather, many different proposals are shown to have potential. While there exists no consensus regarding the most effective club design, a common conclusion is that a club mechanism could indeed generate significant abatement levels. Of course, the success of any club structure would depend on the feasibility of its implementation. The feasibility of climate tariffs, in particular, has been questioned: potentially in conflict with current international trade principals, they are feared to induce retaliation by non-participant nations and lead to escalating protectionism. However, scholars have proposed ways to work around the potential legal issues with trade sanctions or benefits, suggesting that certain GATT articles would legitimate them and that climate amendments should be added to international trade law. Political feasibility presents another potential obstacle for the club approach. Although it appears that minilateralism suffers from weak public support and low political legitimacy, Gampfer's (2016) results also indicate that certain club design configurations (namely, a combination of various club

goods and sanctions) can increase the political feasibility of the approach. Clearly, it would be important for the climate club's design to be optimized not only for effectiveness in mitigation but also for legal and political feasibility. Another relevant question concerns the club's prospective role in the current climate negotiations landscape. Based on the arguments of Weischer et al. (2012) and Victor (2011), a complementary relation between the climate club and the UNFCCC would seem optimal. Rather than replacing the UN system, the climate club is envisioned as a supplementary approach that would generate effective mitigation through a more robust incentive structure, while the UNFCCC would continue to provide a legitimate platform for universal negotiations. In conclusion, the literature indicates that a climate club's prospective potential for generating effective climate change mitigation is high, provided that the club's incentives are successfully designed to induce the needed participation and to achieve political feasibility.

Granted, the findings in this paper are subject to a number of limitations. First of all, since no climate club exists as of yet, all the results regarding the approach's potential are founded solely on theory and simulation models. While the models incorporate real-world data and offer valuable insight into a club's prospects, they are of course built on simplifications and assumptions that may or may not hold in reality. Moreover, it is important to note that the perspective of economics leaves many critical questions unanswered, and more comprehensive legal and political analysis is needed to determine whether a club mechanism could be an effective solution to the problems of international climate negotiations. All in all, the climate club approach deserves more research by scholars of different disciplines as well as attention from policymakers. The international community is in a pressing need of effective cooperation on climate change, and the theoretical potential of the club model is too high for the approach to be disregarded.

REFERENCES

European Commission. (n.d.). *Climate negotiations*. https://ec.europa.eu/clima/policies/international/negotiations_en

Falkner, R. (2016). A minilateral solution for global climate change? On bargaining efficiency, club benefits, and international legitimacy. *Perspectives on Politics, 14*(1), pp. 87-101. https://doi.org/10.1017/S1537592715003242

Gampfer, R. (2016). Minilateralism or the UNFCCC? The political feasibility of climate clubs. *Global Environmental Politics, 16*(3), pp. 62-88. https://doi.org/10.1162/GLEP_a_00366

Hovi, J., Sprinz, D.F., Sælen, H. & Underdal, A. (2016). Climate change mitigation: a role for climate clubs? *Palgrave Communications*. https://doi.org/10.1057/palcomms.2016.20

Hovi, J., Sprinz, D., Sælen, H. & Underdal, A. (2017). Climate clubs: A gateway to effective climate cooperation? *British Journal of Political Science, 49*(3), pp. 1071-1096. https://doi.org/10.1017/S0007123416000788

Håkan, P. (2020). A Climate Club as a complementary design to the UN Paris agreement. *Policy Design and Practice, 3*(1), pp. 45-57. https://doi.org/10.1080/25741292.2019.1710911

Nordhaus, W. (2015). Climate clubs: overcoming free-riding in international climate policy. *American Economic Review, 105*(4), pp. 1339-1370. http://dx.doi.org/10.1257/aer.15000001

Nordhaus, W. (2020, May/June). The climate club: how to fix a failing global effort. *Foreign Affairs*. https://www.foreignaffairs.com/articles/united-states/2020-04-10/climate-club

Sælen, H. (2016). Side-payments: An effective instrument for building climate clubs? *International Environmental Agreements: Politics, Law and Economics, 16*(6), pp. 909-932. https://doi.org/10.1007/s10784-015-9311-8

Victor, D. (2011). *Global warming gridlock: Creating more effective strategies for protecting the planet*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511975714

Weischer L., Morgan J. & Patel M. (2012). Climate clubs: Can small groups of countries make a big difference in addressing climate change? *Review of European Community and International Environmental Law, 21*(3), pp. 177–192. https://doi.org/10.1111/reel.12007

World Meteorological Organization. (2019, September 22). *Global Climate in 2015-2019: Climate change accelerates*. https://public.wmo.int/en/media/press-release/global-climate-2015-2019-climate-change-accelerates